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claims that all the organs are formed either directly or indirectly from it; the mesodermal elements do not arise at any definite and single point, and there is no evidence of any cleavage in it, and still less of the formation of a true cœlom. As the endoderm, so-called, does not give rise to the enteron, its homology with the similarly named layer in the chick is to be doubted.

EARLY DEVELOPMENT OF THE SALPÆ.—F. Todaro in his second preliminary paper, published in the Italian Biological Archives, states that he has observed the entrance of a single zoösperm into the egg, its conversion into a male pronucleus, and its fusion with the female pronucleus to form the segmentation-nucleus, while the yolk is derived from the epithelial cells of the ovarian sac. The origin of the embryos of the solitary and compound Salpæ is also described.—*Journal Royal Microscopical Society, Feb., 1883.*

PSYCHOLOGY.

ANIMAL DOCTORS.—In a recent communication to the Biological Society, M. G. Delaunay observed that medicine, as practiced by animals, is thoroughly empirical; but the same may be said of that practiced by inferior human races, or, in other words, by the majority of the human species. Animals instinctively choose such food as is best suited to them. A large number of animals wash themselves and bathe, as elephants, stags, birds and ants. M. Delaunay lays down as a general rule that there is not any species of animal which voluntarily runs the risk of inhaling emanations arising from their own excrement. Some animals defecate far from their habitations; others bury their excrement; others carry to a distance the excrement of their young. In this respect they show more foresight than man, who retains for years excrement in stationary cesspools, thus originating epidemics. If we turn our attention to the question of reproduction, we shall see that all mammals suckle their young, keep them clean, wean them at the proper time and educate them; but these maternal instincts are frequently rudimentary in women of civilized nations. In fact, man may take a lesson in hygiene from the lower animals. Animals get rid of their parasites by using dust, mud, clay, &c. Those suffering from fever restrict their diet, keep quiet, seek darkness and airy places, drink water and sometimes even plunge into it. When a dog has lost its appetite it eats that species of grass known as dog's grass (*chiendent*), which acts as an emetic and purgative. Cats also eat grass. Sheep and cows, when ill, seek out certain herbs. When dogs are constipated they eat fatty substances, such as oil and butter, with avidity, until they are purged. The same thing is observed in horses. An animal suffering from chronic rheumatism always keeps as far as possible in the sun. The warrior ants have regularly organized ambulances. Latreille cut the antennæ of an ant, and other ants came and covered the wounded part with a transparent fluid secreted from their mouths. If a chimpanzee be wounded, it stops the bleeding by placing its hand on the wound, or dressing it with leaves and grass. When an animal has a wounded leg or arm hanging on, it completes the amputation by means of its teeth. A dog on being stung in the muzzle by a viper was observed to plunge its head repeatedly for several days into running water. This animal eventually recovered. A sporting dog was run over by a carriage. During three weeks in winter it remained lying in a brook where its food was taken to it; the animal recovered. A terrier dog hurt its right eye; it remained lying under a counter, avoiding light and heat, although habitually it kept close to the fire. It adopted a general treatment, rest and abstinence from food. The local treatment consisted in licking the upper surface of the paw, which it applied to the wounded eye, again licking the paw when it became dry. Cats also, when hurt, treat themselves by this simple method of continuous irrigation. M. Delaunay cites the case of a cat which remained for some time lying on the bank of a river; also that of another cat which had the singular fortitude to remain for forty-eight hours under a jet of cold water. Animals suffering from traumatic fever treat themselves by the continued application of cold, which M. Delaunay considers to be more certain than any of the other methods. In view of these interesting facts, we are, he thinks, forced to admit that hygiene and therapeutics, as practiced by animals, may, in the interests of psychology, be studied with advantage. He could, thinks the *British Medical Journal*, go even further, and say that verterinary medicine, and perhaps human medicine, could gather from them some useful indications, precisely because they are prompted by instinct, which are efficacious in the preservation or the restoration of health.

SUICIDE OF SCORPIONS—The following experiments made on two species of South African scorpions, by C. L. Morgan, indicate that they do not have any suicidal instinct. He detected no signs of fresh wounds made by the sting. The nature of the experiments were as follows .

1. Condensing a sun-beam on various parts of the scorpion's body. The creatures always struck with the sting round, across and over the heated spot, and seemed to try and remove the source of irritation.

2. Heating in a glass bottle. As this admits of most careful watching, I have killed some twenty or thirty individuals in this way. The creatures very commonly pass the sting over the body, as if to remove some irritant. The poison exudes from the point of the sting and then coagulates.

3. Surrounding with fire or red hot embers, I first took a newspaper, moistened a ring about a foot in diameter with alcohol, and placed a scorpion within the ring. The paper was, by this time ignited. He walked without hesitation through the fire and

tried to make his escape. I made a ring of red hot wood embers and placed a scorpion in the middle. He pushed his way out, displacing two of the embers. I made a better fire-wall, and put him in the middle again. He crept over the embers. I placed him in the midst of a ring of embers on the flat and much-heated stone of the fire-place. He crept over the embers again, but this time got baked before he could escape.

4. Placing in burning alcohol. I placed a layer of an eighth of an inch of alcohol in a shallow vessel, lit the alcohol, and placed the scorpion in the midst of the burning spirit.

5. Placing in concentrated sulphuric acid. I moistened the bottom of a large beaker with a very thin layer of concentrated sulphuric acid, and put in a scorpion. The creature died in about ten minutes. (I have also tried other strong acids, a concentrated solution of sodium hydrate, and a potassium cyanide solution.)

6. Burning phosphorus on the creature's body. I placed a small pellet of phosphorus near the root of the scorpion's tail, and lit the phosphorus with a touch of a heated wire. The creature tried to remove the phosphorus with its sting, carrying away some of the burning material.

7. Drowning in water, alcohol and ether.

8. Placing in a bottle with a piece of cotton-wool, moistened with benzine.

9. Exposing to sudden light. I have not tried special experiments as to this point, but have, on turning over an ant-ball, suddenly exposed a scorpion, hitherto in complete or almost complete darkness, to the full glare of South African sunshine.

10. Treating with a series of electric shocks.

11. General and exasperating courses of worry.

I think it will be admitted that some of these experiments were sufficiently barbarous (the sixth is positively sickening) to induce any scorpion who had the slightest suicidal tendency to find relief in self-destruction.

I have in all cases repeated the experiments on several individuals. I have in nearly all cases examined the dead scorpion with a lens. My belief is that the efforts made by the scorpion to remove the source of irritation are put down by those who are not accustomed to accurate observation as efforts at self-destruction. On one occasion I called in one of my servants to watch the death of a scorpion by gradually heating it in a glass bottle. The creature at once began moving its sting across and over its back, upon which my servant exclaimed, "See it is stinging itself!" I do not wish to imply that all the cases of alleged scorpion suicide are merely instances of careless observation. All I wish to do in this note is to record my individual experience, and to state clearly that after making a series of observations as carefully as I could on a large number of individuals, I cannot place on record a single instance of clear and unmistaken scorpion suicide.—*Nature.*

EXHIBITION OF REASONING POWER IN THE POLAR BEAR.—A contributor to *Nature* relates the following instance of remarkable intelligence on the part of this animal in cracking cocoanuts. In the Clifton Zoölogical Gardens there are two female Polar bears, between two and a-half and three years old, which came here quite young. A cocoanut was thrown into the tank, it sunk a long way, and the bear waited quietly till after some time it rose a little out of her reach. She then made a current in the water with her paw, and thus brought it within reach. This habit has already been several times noticed in Polar bears. She then took it on shore and tried to break it by leaning her weight on it with one paw. Failing in this, she took the nut between her fore-paws, raised herself on her hind legs to her full height, and threw the nut forwards against the bars of the den, three or four feet off. She then leaned her weight on it, hoping she had cracked it, but failed again. She then repeated the process, this time successfully. The keeper told the writer (J. G. Grenfell) she employed the same method to break the leg-bone of a horse. That this is the result of individual experience, and not of instinct, is clear from the fact that her companion has not learned the trick of opening them thus, nor could this one do it when she first came. The method of throwing is precisely similar to that adopted by the Cebus monkey described by Mr. Romanes (Animal Intelligence).

THE SENSES OF BEES.—Sir John Lubbock recently read to the members of the Linnean Society an account of his further observations on the habits of insects made during the past year. The two queen ants which have lived with him since 1874, and which are now, therefore, no less than eight years old, are still alive and laid eggs last summer as usual. His oldest workers are seven years old. Dr. Müller, in a recent review, had courteously criticized his experiments on the color-sense of bees; but Sir John Lubbock pointed out that he had anticipated the objections suggested by Dr. Müller, and had guarded against the supposed source of error. The difference was, moreover, not one of principle, nor does Dr. Müller question the main conclusions arrived at or doubt the preference of bees for blue, which, indeed, is strongly indicated by his own observations on flowers. Sir John also recorded some further experiments with reference to the power of hearing. Some bees were trained to come to honey which was placed on a musical box on the lawn close to the window. The musical box was kept going for several hours a day for a fortnight. It was then brought into the house and placed out of sight, but at the open window, and only about seven yards from where it had been before. The bees, however, did not find the honey, though when it was once shown them they came to it readily enough. Other experiments with a microphone were without results. Everyone knows that bees when swarming are popularly, and have been ever since the time of Aristotle, supposed to be influenced by clanging-kettles, &c. Experienced apiarists are now disposed to doubt whether the noise has really any effect; but Sir John suggests that even if it has, with reference to which he expressed no opinion, it is possible that what the bees hear are not the loud, low sounds, but the higher overtones at the verge of or beyond our range of hearing. As regards the industry of wasps, he timed a bee and a wasp, for each of which he provided a store of honey, and he found that the wasp began earlier in the morning (at four A. M.), and worked on later in the day. He did not, however, quote this as proving greater industry on the part of the wasp, as it might be that they are less sensitive to cold. Moreover, though the bee's probocis is admirably adapted to extract honey from tubular flowers, when the honey is exposed, as in this case, the wasp appears able to swallow it more rapidly. This particular wasp began work at four in the morning, and went on without any rest or intermission till a quarter to eight in the evening, during which time she paid Sir John 116 visits.

THE FRONTIERS OF INSANITY.—In a lecture before the Ecole de Medicine[1] of Paris. M. Ball describes the tendencies to insanity and abnormal mental action observed in many persons, and classifies them. He concludes an interesting discussion by asserting as Maudesley has done before him, that the world owes nearly all its important innovations to persons whose minds occupy this frontier position. He includes in this class original thinkers, reformers, discoverers and inventors. He confirms the truth of the language of Pope:

> "Great wit to madness sure is near allied,
> And thin partitions do their realms divide."

ANTHROPOLOGY.[2]

RESEARCHES OF MIKLUKHO-MACLAY.—Three or four years ago we used to read almost every month, something wonderful about the researches of Maclay in New Guinea. The gentleman has turned up again, and has been giving to the Russian Geographical Society the benefit of his experience (*Nature*, Dec. 7 and 21, 1882). Of his wanderings we shall say nothing, but simply record his contributions to knowledge respecting anthropology. The natives of the north-west coast of New Guinea, near Astrolabe bay, are in the lowest stage of culture, being ignorant of the use of metals and employing only implements of stone, bone and wood. They did not even know how to make a fire. Their grandfathers told them of a time when they had no fire, they ate

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[1] Published in the *Revue Scientifique*.

[2] Edited by Professor OTIS T. MASON, 1305 Q street, N. W., Washington, D. C.